

APPENDIX 2C-4

July 2005 Consolidated Pre-Meeting Comments

Peer Review of Proposed Land Waste and Other Relevant Indicators for EPA's 2006 Report on the Environment

July 19, 2005

Notice:

Pre-meeting comments were prepared by each consultant individually prior to the meeting. They are preliminary comments only, and are used to help consultants become familiar with the document and charge questions, develop the agenda, and identify key issues for discussion. During the meeting, consultants may expand on or change opinions expressed in their pre-meeting remarks and may introduce additional issues. For these reasons, pre-meeting comments should be regarded as preliminary and do not reflect the final conclusions and recommendations of individual consultants. These pre-meeting comments will be included as an appendix in the meeting summary report, along with other background materials.

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Land Waste Reviewer Biographies

Robert Pojasek

Pojasek & Associates

Dr. Pojasek (Pojasek & Associates) is a management consultant specializing in process improvement and performance scoring. With 34 years experience working with a diverse range of manufacturing and service sectors, NGOs and governments, he has an understanding of inputs, outputs and the conversion process itself. Dr. Pojasek is best known for the development of the highly acclaimed ***Systems Approach***. This approach uses quality management methodologies to facilitate communication between environment, health and safety function and other functions in the company. His research and publications have helped companies, governments, universities and communities plan and implement programs to move them down the path towards operational excellence and sustainable development. He is the principal author of the US EPA publication, ***An Organizational Guide to Pollution Prevention*** and has served on the EPA Science Advisory Board. Dr. Pojasek is an Adjunct Professor at Harvard University's School of Public Health where he teaches courses on risk management. He also teaches a distance-learning course at the Harvard Extension School that explores the path to sustainable development. He received his bachelor's degree in chemistry from Rutgers University and his Ph.D. in chemistry from the University of Massachusetts.

Debra R. Reinhart

Civil and Environmental Engineering Department
University of Central Florida

Dr. Reinhart is Associate Dean of the University of Central Florida's College of Engineering and Computer Science. Dr. Reinhart has been a member of the UCF faculty since 1989. During the past fifteen years, she has been teaching and conducting research in the solid and hazardous waste fields. Dr. Reinhart received her B.S. in Environmental Engineering from UCF and M.S. and Ph.D. degrees in Environmental Engineering from the Georgia Institute of Technology. She is a registered professional engineer in Florida and Georgia, a fellow of the American Society of Civil Engineers, and a Diplomate of the American Academy of Environmental Engineers. Dr. Reinhart has authored four books and over 100 journal and proceeding articles.

Comments for Group 1 Indicators

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Attachment 2: Comment Sheet for Group 1 Indicators

Topic Area: **Land Waste**
 Indicator Name: **Quantity of Municipal Solid Waste Generated and Managed**

- 1) Please indicate the extent to which you think the proposed indicator is appropriate, adequate, and useful (AA&U) for evaluating and/or contributing to an overall picture of the trends in wastes and their effects on human health and the environment.

1	2	3	4
Indicator is not AA&U	Indicator is of somewhat AA&U	Indicator is largely AA&U	Indicator is completely AA&U

Pojasek: (2) The sense with this indicator is “trust us on this one!” Reviewers were **not** presented with a list of assumptions and limitations to the data used by EPA to generate this number. There is not a good picture of connections to the effects on human health and the environment from MSW incineration, transportation effects, issues with transfer stations, and issues associated with operating and closed municipal solid waste landfills. MSW is a major source of greenhouse gas emissions. This is not noted in the “Table of Group 1 and Group 2 Indicators” provided in Tab 4. The EPA commenter says that the contribution is handled in the Air Chapter. However, most GHG emissions calculators that I am familiar with grossly understate the contributions from solid wastes. They tend to be focused on energy generation and the use of fuels.

Reinhart: (2) There appear to be a limited number of indicators that meet the criteria established. This indicator has many limitations. Its selection suggests that the quantity of MSW is proportional to the amount of waste that is placed in the land. The amount of MSW generated per capita has not changed over the past several years, however it is difficult to accept that the amount and toxicity of other wastes per capita (such as nuclear, construction and demolition, defense, industrial, medical, mining, etc) have experienced similar patterns. Since these data are apparently unavailable, MSW quantity remains the indicator of choice.

- 2) Please indicate the extent to which you think the proposed indicator makes an important contribution to answering the question: What are the trends in waste and their effects on human health and the environment? (Note: An indicator may be judged less important if it makes a smaller or less critical contribution to answering the question posed than the other indicators, or if it covers an area of less or diminishing importance environmentally.)

1	2	3	4
Indicator is not important	Indicator is of minor importance	Indicator is important	Indicator is critical

Pojasek: (3) As imperfect as this indicator may be, it seems to be consistent and covers a long period of time. It can meet the *trend* test even though the hazardous waste indicator cannot meet

this test. I am still uncertain that its trend has a direct relationship to human health and the environment. Incineration facilities have definite effects on human health and the environment that would not be present if this were not an option. Issues of mercury, fine particulates and dioxin emissions are well known. Recycling and other trash pickup, transfer and disposal contribute to greenhouse gas emissions and conventional air pollutants with the vehicles and equipment used.

Reinhart: (3) The number of landfills has declined significantly over time, suggesting a reduced impact to land. However, given the constant amount of waste generated and directed to landfills, this actually means a greater quantity buried per landfill. Does this mean there is less impact on human health and the environment? A large landfill may be easier to regulate than many small landfills and may benefit from economy of scale, however fugitive releases may be more difficult to detect. Landfills are increasingly protective of the environment, however one must wonder about waste placed in landfills prior to RCRA regulations. These wastes may represent a more critical impact.

3) To what extent do you think the indicator meets the following indicator definition:

An “indicator” is a numerical value derived from actual measurements of a pressure, ambient condition, exposure, or human health or ecological condition over a specified geographic domain, whose trends over time represent or draw attention to underlying trends in the condition of the environment.

1	2	3	4
Doesn't meet the definition	Only partly meets the definition	Largely meets the definition	Fully meets the definition

Pojasek: (2) Information is taken from a number of sources and used to generate an estimate. Only part of the estimate is based on **actual measurements**. The information does not generally account for human health or ecological conditions from presently operating facilities – only from anecdotal information that these facilities are creating fewer impacts than facilities in the past. I do believe that the numbers do draw attention to potential condition of the environment if this waste were to continue to increase.

Reinhart: (2) Because this indicator is based on the materials flow methodology, the data collected provide an indirect measurement. There is no actual measurement of the pressure on the environment due to MSW disposal or the amount of waste disposed of in landfills. This waste stream is only a fraction of waste land disposed.

4) To what extent do you think the indicator meets each of the following indicator criteria:

- a) The indicator makes an important contribution to answering a question for the ROE. (In this context, “important” means that the indicator answers a substantial portion of and/or a critical part of the question.)

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (2) MSW is a significant fraction of land disposed waste, but probably not the most important fraction of waste that may adversely affect human health and the environment.

- b) The indicator is objective. It is developed and presented in an accurate, clear, complete, and unbiased manner.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (3)

- c) The underlying data are characterized by sound collection methodologies, data management systems that protect its integrity, and quality assurance procedures.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (3) The data sources are the Franklin studies and the Chartwell Atlas. The Franklin studies have been conducted for many years and the approach has been well scrutinized. While the approach is an indirect determination of MSW through a material flow mass balance, adjusted by actual waste characterization studies, it is sound. Since it cannot be applied locally, there is no means to verify its accuracy. Chartwell data depend on responses from states and according to the QA/QC, only 80% of the states respond.

d) Data are available to describe changes or trends, and the latest available data are timely.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (3)

Reinhart: (2) There is always a two-year lag in data collection. The 2003 data on MSW generation are now available and should be added.

e) The data are comparable across time and space, and representative¹ of the target population. Trends depicted in this indicator accurately represent the underlying trends in the target population.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (3)

Reinhart: (2) The target population is waste deposited in the ground and resulting contamination of land. The indicator (amount of MSW generated and managed) is evaluated using a materials flow methodology and the number of landfills. It is unlikely that the landfilled waste trend is mirrored by MSW generation rate and the number of landfills. There are no data to support this conclusion. Perhaps a better indicator would be the total amount of waste landfilled and its rate of degradation, but this information is impossible to collect.

f) The indicator is transparent and reproducible. The specific data used and the specific assumptions, analytic methods, and statistical procedures employed are clearly stated.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (3)

¹ An indicator seeks to describe trends in an overall target "population" (e.g., land area, type of surface water, type of emissions, U.S. population), yet data often can only be sampled from a subset of this population. The validity of the trends described by the indicator will depend on the degree to which the sampled population is representative of the target population.

Please explain:

Pojasek:

- a) EPA needs an indicator with a better link to human health and the environment. They may wish to consider the international movement to “Zero Waste” as a way to encourage source reduction over recycling. They could fund this movement in the USA as they have funded waste minimization/pollution prevention in the past. More information in my answer to Question 6.
- b) EPA has done little to test the accuracy of the mass flow calculations. I do not find the numbers to be “clear” and “complete” and have commented on this.
- c) There are no verified and disclosed data management systems and quality assurance practices in place.
- d) The trending is probably good given the compensating errors and the data is up to date.
- e) The data is good only on the national level as disclosed by the EPA. Regional trending is not possible. Large cities are a major problem. New York City is transporting its solid wastes as far as South Carolina creating many environmental impacts in doing so. What about Los Angeles, Houston, Chicago, Atlanta and other larger cities?
- f) The indicator is NOT transparent and is not reproducible by a third party (according to EPA). EPA needs to test the data more and make it more transparent. FORTUNE magazine always publishes its assumptions when it publishes its “Fortune 500” each year. EPA should at least meet this test for transparency.

Reinhart:

- 5) Do you have any suggestions for more effective graphic presentation of the data?
If yes, please describe.

Pojasek: No.

Reinhart: Show all data points available to better appreciate fluctuation in generation rates. Will figures be presented in color? To not it may be difficult to interpret the data.

- 6) Please provide any additional comments, suggestions, or concerns regarding the indicator that you have not already noted in Questions 1 through 5. In particular, note any limitations to the indicator that you have not already described in your responses to the preceding questions.

Pojasek: The EPA did not make available the information that it based its number on. The Chartwell Directory and Atlas of Solid Waste Disposal Facilities sells for \$995. The *Biocycle* is no available except for subscription. The EPA responded to this reviewer by saying that “These data are considered very credible.” When asked for a list of assumptions used in compiling the data, the EPA responder was non-responsive. The EPA information in our review tab states: “Most of the data are from public sources for which the quality assurance and controls processes are not under the direct control of EPA.”

The EPA states, “Because of the complexity, the study would not be readily reproducible by a third party.” EPA also lists a relatively large number of limitations or gaps in the data that may

mislead a user about fundamental trends in the indicator over the time period for which data are available. In the comments to this reviewer, the EPA commenter dismisses this statement out of hand by saying, “The proposed MSW Generation and Management Indicator only includes information on those wastes that fall within the definition of MSW used by EPA.” The responder goes on to say, “The waste streams mentioned can be quite large, however, the Agency does not regularly collect information on them, which is a requirement for an indicator.” Finally the EPA responder states, “EPA intends to describe other significant categories of waste in additional information presented in the Land Chapter to provide as complete a picture of waste in the United States.” This will change the basis of the data point unless the information is available for other past years and the data is recalculated before being presented. These wastes include:

- Non-hazardous industrial waste
- Construction and demolition debris
- Municipal wastewater treatment sludge
- Automobile bodies
- Combustion ash
- Drinking water treatment sludge
- Recycled materials and residues that find their way back into the MSW stream (value too low to recycle or items that were mistakenly added to this stream)
- Universal wastes
- Household hazardous waste that is not separately collected.

Household hazardous waste, if not aggressively solicited at the local level, changes the impacts to human health and the environment when managed both at MSW landfills and incinerators. EPA needs a much better handle on this issue.

Recyclers may place their “residuals” back into the MSW stream when the price for the commodities drops (e.g., glass prices are often unattractive for effective recycling). There are many items they receive from curbside pickups that are not recyclable. These items also find their way back into the MSW stream. EPA has no means of determining how significant these contributions may be. Once the recycled component has been subtracted from the MSW quantity, no corrections are made for this loop. I believe this loop to be large enough to warrant such a correction.

I believe that EPA should place less emphasis on “Pay as You Throw” as a means of increasing the recycled component of the MSW stream. <http://www.epa.gov/epaoswer/non-hw/payt/index.htm> Instead, they should consider the international movement that seeks to actually reduce solid waste at the source. This movement is called “Zero Waste.” It is akin to what the EPA has traditionally funded on the hazardous waste side with waste minimization and pollution prevention activities. Several US cities have formally adopted this movement (San Francisco, New York and Chicago). Some of their web sites are as follows:

<http://www.zerowaste.ca.gov/>
<http://www.zerowasteamerica.org/>
<http://www.grn.org/zerowaste/index.html>
<http://www.nowaste.act.gov.au/>

<http://www.zerowaste.co.nz/>
<http://www.targetzerocanada.org/>

If EPA were to get active funding zero waste programs, they would be in a position to create a ***leading indicator*** of the amount of funds committed as a function of their total budget. This indicator would meet all the criteria of an indicator and would have a definitive link to human health and the environment.

Reinhart: There really is no discussion of the implication of the data relative to the question posed. There is a typographical error in paragraph 3, last line.

7) Overall, this indicator:

Pojasek: **X** Should be included in ROE06 TD with the modifications identified above.

Reinhart: **X** Should be included in ROE06 TD with the modifications identified above.

Attachment 2: Comment Sheet for Group 1 Indicators

Topic Area: **Land Waste**

Indicator Name: **Quantity of RCRA Hazardous Waste Generated and Managed**

1. Please indicate the extent to which you think the proposed indicator is appropriate, adequate, and useful (AA&U) for evaluating and/or contributing to an overall picture of the trends in wastes and their effects on human health and the environment.

1	2	3	4
Indicator is not AA&U	Indicator is of somewhat AA&U	Indicator is largely AA&U	Indicator is completely AA&U

Pojasek: (3) There are some gaps in this data for SQG and CESQG as well as for wastes that may fall outside the regulatory definitions (and may be hazardous) and for overly protective filers (that include wastes that are not deemed hazardous). There is a need to audit the manner in which the accounting is conducted by the hazardous waste generators and TSDF's to make certain there are not serious problems here.

Reinhart: (2) The quantity of hazardous waste placed in land does not necessarily track impact on human health and the environment. Thirty percent of the material is treated and placed in well-controlled landfills. Wastes that are deep-well injected are large in volume but fairly dilute, so the mass of the hazardous constituent is low. Therefore this indicator is only an indirect measure of the actual risk of land disposal. Further, the fact that in two years a 19% decline was reported followed by an 18% decline in one year, seems unlikely suggesting that there are inherent difficulties in isolating the amount of waste that is actually generated and ultimately disposed in the land.

2. Please indicate the extent to which you think the proposed indicator makes an important contribution to answering the question: What are the trends in waste and their effects on human health and the environment? (Note: An indicator may be judged less important if it makes a smaller or less critical contribution to answering the question posed than the other indicators, or if it covers an area of less or diminishing importance environmentally.)

1	2	3	4
Indicator is not important	Indicator is of minor importance	Indicator is important	Indicator is critical

Pojasek: (3) The EPA may only have two data points (1999 and 2001). It is impossible to trend this limited amount of information. Assuming the data from 2003 are available, this still does not provide for rigorous trending information. The definition of hazardous waste in RCRA does not necessary correlate directly to human health and the environment. There certainly are wastes included that may pose different level of risks. They are not all even in this area. It would be very useful to have some kind of hazard rating of the aggregated numbers (e.g., a weighting factor applied to each set included in the total) to determine if the hazards have dropped along

with the total numbers. I am thinking of the type of hazard classification that the NGO, Environmental Defense, applies to the TRI numbers collected by EPA.

Reinhart: (3) Hazardous wastes quantities probably tracks other land disposed waste but the potential for double counting is significant. Further the affect of excluding SQGs and CESQGs is unknown and could be important.

3. To what extent do you think the indicator meets the following indicator definition:

An “indicator” is a numerical value derived from actual measurements of a pressure, ambient condition, exposure, or human health or ecological condition over a specified geographic domain, whose trends over time represent or draw attention to underlying trends in the condition of the environment.

1	2	3	4
Doesn't meet the definition	Only partly meets the definition	Largely meets the definition	Fully meets the definition

Pojasek: (2) Not sure that the measurement is as valid as thought. The people in the companies that complete these biennial reports often turn over faster than the reports are generated. There is a learning curve that may affect data quality. I am not sure there is a link between the number and the ambient condition, exposure, human health or ecological condition. Deep wells develop leaks in their annulus and contaminate the ground. Burning wastes for energy or by incineration cause air pollution and ash solid wastes. Treating wastes causes residues and emissions from the treatment. Final disposal sites have leaked at times. There is no free lunch here and there is no measure of these side effects in the indicator.

Reinhart: (3) Combined with MSW, these wastes represent a significant, but unknown fraction of waste land disposed. The indicator should track contributions of all types of wastes.

4) To what extent do you think the indicator meets each of the following indicator criteria:

- a. The indicator makes an important contribution to answering a question for the ROE. (In this context, “important” means that the indicator answers a substantial portion of and/or a critical part of the question.)

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (3) Combined with MSW, these wastes represent a significant, but unknown fraction of waste land disposed. The indicator should track contributions of all types of wastes.

- b. The indicator is objective. It is developed and presented in an accurate, clear, complete, and unbiased manner.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (2) It is difficult to understand what is truly accounted for in the reported data and what is not when considering the potential for double counting, the fact that waste categorized as treated may also be land disposed, and the exclusion of SQGs and CESQGs.

- c. The underlying data are characterized by sound collection methodologies, data management systems that protect its integrity, and quality assurance procedures.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (3) Cradle to grave monitoring of hazardous waste is well regulated and enforced and the negative consequences of false reporting are publicized. Hazardous Waste Reports are probably representative of hazardous waste generated by LGQs.

- d. Data are available to describe changes or trends, and the latest available data are timely.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (1)

Reinhart: (4) Reporting is frequent and timely.

- e. The data are comparable across time and space, and representative² of the target population. Trends depicted in this indicator accurately represent the underlying trends in the target population.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (2)

Reinhart: (3) Hazardous waste generation is probably representative of wastes of concern that are placed on land.

² An indicator seeks to describe trends in an overall target "population" (e.g., land area, type of surface water, type of emissions, U.S. population), yet data often can only be sampled from a subset of this population. The validity of the trends described by the indicator will depend on the degree to which the sampled population is representative of the target population.

- f. The indicator is transparent and reproducible. The specific data used and the specific assumptions, analytic methods, and statistical procedures employed are clearly stated.

1	2	3	4
Doesn't meet this criterion at all	Only partly meets this criterion	Largely meets this criterion	Fully meets this criterion

Pojasek: (3)

Reinhart: (3) Since this indicator is representative of actual land-disposed hazardous wastes, data are transparent and reproducible. However, double counting and the large number of management pathways for hazardous wastes reduces the clarity of the data.

Please explain:

Pojasek:

- If the legal definition of the hazardous waste is accurate and related to the risks associated with the chosen management technique AND there are no changes in the regulations, there may be such a contribution.
- It is not accurate, or complete and is biased by the fact that it represents a regulatory finding that may only partially be directly related to risk.
- The collection methodology may have problems with person turnover and review. It is difficult to manage something that is done infrequently. EPA has some quality assurance procedures to interpret the data, but I am not aware that they have actively enforced against companies that may be incorrectly completing this report.
- There can be no rigorous trends with 2 or three data points. The data is old and only collected every two years. There are situations that happen within that timeframe that are difficult to discern in the interpretation.
- The number of points is too low. There are different categories of HW generators.
- The indicator is not completely transparent since EPA has to interpret the data and try to avoid double counting. There are a relatively long list of assumptions that might not accompany the data at all times. The procedures are generally stated perhaps to hide the complexity of the analysis.

Reinhart: [see above]

- 5) Do you have any suggestions for more effective graphic presentation of the data?
If yes, please describe.

Pojasek: No.

Reinhart: No

- 6) Please provide any additional comments, suggestions, or concerns regarding the indicator that you have not already noted in Questions 1 through 5. In particular, note any limitations to the indicator that you have not already described in your responses to the preceding questions.

Pojasek: It would be more useful to mandate some kind of annual report from the TSDF's to supplement with perhaps some voluntary reporting from the LQG to fill in the missing years in the future. I am sure that most of these two categories have the numbers and would make them available on a voluntary basis if asked.

Many decreases in HW may come from production moving off-shore. It is important that this is NOT interpreted as pollution prevention at the source.

I want to re-emphasize that most of the HW management techniques have had impacts on the environment and human health – deep wells, boilers, incinerators and wastewater treatment.

There have been many EPA studies to show that many toxic constituents that enter POTW's are not removed and enter the environment. Chemical & Engineering News has had a couple of feature articles on this topic. It is a fact that most drinking water intakes on the Mississippi and other large rivers are in close proximity downstream from the "treated" wastewater discharge point. There are also issues with HW landfills not being as contained as they are supposed to be. This indicator does NOT capture these items. However, it is the best that can be done with what is available. Too bad there wasn't a way to improve on this indicator.

A much better indicator would be the amount of money spent by EPA as a function of their total budget on waste minimization/pollution prevention technical assistance (e.g., PPIS grants) and research. This is a *leading* indicator. EPA has the data to trend this indicator.

Reinhart: None

7) Overall, this indicator:

Pojasek: X Should be included in ROE06 TD with the modifications identified above.

Reinhart:

 X Should be included in ROE06 TD.

Comments for Group 2 Indicators

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Attachment 3: Comment Sheet for Group 2 Indicators

Topic Area: **Contaminated Lands**

Indicator Name: **Human Exposure Under Control on Contaminated Lands**

1) To what extent do you agree with this statement:

This indicator is appropriate, adequate, and useful (AA&U) for evaluating and/or contributing to an overall picture of the trends in contaminated lands and their effects on human health and the environment.

1	2	3	4
Indicator is not AA&U	Indicator is of somewhat AA&U	Indicator is largely AA&U	Indicator is completely AA&U

Pojasek: (2) EPA determines whether “contamination is below protective, risk-based levels at NPL and high priority RCRA Corrective Action Sites.” It is not clear that EPA has predetermined risk-based levels for all contaminants found at these sites. EPA claims, “‘Unacceptable risk’ is defined based on the cancer risk range..” There are other human risks associated with these sites that lie outside of this assumption (e.g., endocrine disruptors). How significant might this be? The EPA is not including new sites that are discovered as a result of due diligence (All Appropriate Inquiry Rule) on property transfers. EPA is also not including new sites that are created with the “reportable quantity” spill response program. Most of the RCRA Corrective Action sites are not currently included. Trending might be impacted by the EPA statement, “Advances in risk assessment practice to better address sensitive populations will be automatically incorporated into the indicator as they are incorporated into practice.” The indicator does not address ecosystems (i.e., the effect on the environment).

Reinhart: (2) The indicator selected, human exposure under control, is an appropriate measure of the impact of contaminated lands. However, the National Priority List captures a small fraction of contaminated lands and these sites receive priority in assessment and remediation funded by the Superfund. There are thousands of leaking underground storage tank sites, RCRA corrective action sites, Department of Energy sites, and state sites missing from this list. It is questionable as to whether the percent of sites with human exposure under control at NPL sites reflects the trend for all sites with contaminated lands.

2) To what extent do you agree with this statement:

This indicator makes an important contribution³ to answering the question: What are the trends in contaminated lands and their effects on human health and the environment?

³ Note: An indicator may be judged less important if it makes a smaller or less critical contribution to answering the question posed than the other indicators, or if it covers an area of less or diminishing importance environmentally.

1
Indicator is not
important

2
Indicator is of
minor importance

3
Indicator is
important

4
Indicator is
critical

Pojasek: (2) It is difficult to determine how important this indicator may be for determining the trends in contaminated lands and their effects on human health and the environment! Based on my comments in this Attachment, EPA needs to rethink this indicator by studying the rest of the universe of contaminated lands that they are tracking to see if these could potentially skew the data significantly. They need to reassess their ability to measure ecosystem damages. They also need to reassess the consistency of their risk assessments and the moving target of correcting previously conducted risk assessments for their impact on sensitive populations.

Reinhart: (2) Because the NPL sites receive priority in remediation, it is not likely that they reflect the trends for all sites with contaminated lands.

- 3) Please provide any additional comments, suggestions, or concerns regarding the indicator that you may have.

Pojasek: The EPA did NOT respond to my question on reportable quantity spills. This program with the EPA tracks all these spills in the United States. Some of these spills have human exposures and ecological damage. They are not included in the Superfund list of sites that is tracked by this indicator. However, they are covered by the National Contingency Plan. There is a need to investigate whether this represents a significant impact on what this indicator has been suggested to measure.

The EPA is using a limited definition of contaminated lands - "Contaminated lands include sites contaminated as a result of improper disposal of toxic and hazardous wastes *in the past*, as well as improper handling or accidents *occurring at active hazardous waste management facilities* (my emphasis added). EPA states, "Superfund NPL and RCRA Corrective Action sites are a subset of contaminated lands in the U.S." This ignores the reportable quantity spills that are tracked by EPA and the "All Appropriate Inquiry Rule" sites that are not currently tracked by EPA but may be a source of human exposure or ecological damage. The EPA needs to rethink this restrictive definition or conduct an investigation to show that it is a justifiable assumption.

EPA has provided a listing of **indicator limitations** for the peer review. However, there is no indication that they tested the significance of the CERCLIS sites that are not covered and the approximately 5,800 RCRA Corrective Action sites that are not included. They did not list the reportable quantity spill sites omission as a limitation. EPA states, "No formal study has been conducted regarding the reproducibility of the survey responses." These responses are used to compile this indicator.

Reinhart: [no answer provided]

Attachment 3: Comment Sheet for Group 2 Indicators

Topic Area: **Contaminated Lands**

Indicator Name: **Contaminated Groundwater Under Control on Contaminated Lands**

1) To what extent do you agree with this statement:

This indicator is appropriate, adequate, and useful (AA&U) for evaluating and/or contributing to an overall picture of the trends in contaminated lands and their effects on human health and the environment.

1
Indicator is not
AA&U

2
Indicator is of
somewhat AA&U

3
Indicator is
largely AA&U

4
Indicator is
completely
AA&U

Pojasek: (2) This indicator does not have a sufficient link to effects on human health and the environment. Being “under control” does not mean that there are no longer environmental and health impacts! Some of the groundwater management techniques (e.g., air stripping) potentially have their own environmental and health impacts. Groundwater that is returned to a POTW may have constituents that are either transferred to the sludge, the air (during treatment) or through the plant and into the receiving stream. The EPA has studies to show that POTWs are responsible for a large number of toxics in our drinking water. (Bette Hileman, “Troubled Waters,” *Chemical & Engineering News*, December 3, 2001). The EPA is not including new sites that are discovered as a result of due diligence (All Appropriate Inquiry rule) on property transfers. EPA is not including new sites that are created with the reportable quantity spill response program.

Reinhart: (3) This indicator is more relevant to land contamination than the broad measurement of human exposure. It is surprising that the percent of sites that have groundwater under control is less than the number of sites with human exposure under control. The text discusses data from 2002 – 2004, however one figure (221-1) shows 2003 and 2004 only, while the other figure (221-2) presents data from 2002-2004.

2) To what extent do you agree with this statement:

This indicator makes an important contribution⁴ to answering the question: What are the trends in contaminated lands and their effects on human health and the environment?

⁴ Note: An indicator may be judged less important if it makes a smaller or less critical contribution to answering the question posed than the other indicators, or if it covers an area of less or diminishing importance environmentally.

1
Indicator is not
important

2
Indicator is of
minor importance

3
Indicator is
important

4
Indicator is
critical

Pojasek: (2) It is difficult to determine how important this indicator may be for determining the trends in contaminated lands and their effects on human health and the environment! Based on my other comments in this Attachment, EPA needs to rethink this indicator by studying the rest of the universe of contaminated lands that they are tracking to see if these could potentially skew the data significantly.

Reinhart: (3) Groundwater contamination is probably the most important consequence of land contamination since a majority of the US population depends on groundwater for potable and irrigation water. However, this indicator focuses only on NSP sites, which have higher cleanup likelihood than other contaminated sites. Further, this indicator does not reflect other land-based exposure pathways such as surface water contamination and direct contact with contaminated soil or hazardous wastes.

- 3) Please provide any additional comments, suggestions, or concerns regarding the indicator that you may have.

Pojasek: The EPA did NOT respond to my question on reportable quantity spills. This program within the EPA tracks all these spills in the United States. Some of these accidental contamination events require groundwater or other remedial treatment. They are not included in the Superfund list of sites that is tracked by this indicator. However, they are covered by the National Contingency Plan. There is a need to investigate whether this represents a significant impact on what this indicator has been suggested to measure.

EPA is using a limited definition of contaminated lands – “Contaminated lands include sites contaminated as a result of improper disposal of toxic and hazardous wastes *in the past*, as well as improper handling or accidents *occurring at active hazardous waste management facilities* (my emphasis added). EPA states, “Superfund NPL and RCRA Corrective Action sites are a subset of contaminated lands in the U.S.” This ignores the reportable quantity spills that are tracked by EPA and the “All Appropriate Inquiry Rule” sites that are not currently tracked by EPA but may be a source of groundwater contamination. The EPA needs to rethink this restrictive definition or conduct an investigation to show that it is a justifiable assumption.

EPA has provided a listing of **indicator limitations** for the peer review. However, there is no indication that they tested the significance of the CERCLIS sites that are not covered and the approximately 5,800 RCRA Corrective Action sites that are not included. They did not list the reportable quantity spill sites omission as a limitation. EPA states, “No formal study has been conducted regarding the reproducibility of the survey responses.” These responses are used to compile this indicator.

Reinhart: [no answer provided]

General Comments for Group 1 and Group 2 Indicators

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Attachment 4: Comment Sheet for General Questions for Group 1 and 2 Indicators

Topic Area (circle one): **Land Waste (Group 1) or Contaminated Lands (Group 2)**

- 1) Considering both indicators within each group *together*, does either indicator clearly seem to be more appropriate, adequate, or useful for evaluating and/or contributing to an overall picture of the trends in wastes and their effects on human health and the environment (Group 1) or trends in contaminated land and their effects on human health and the environment (Group 2) than the other? Does either indicator seem to be more important than the other for answering the question they are intended to answer? (Note: An indicator may be judged less important if it makes a smaller or less critical contribution to answering the question posed than the other indicators or if it covers an area of diminishing interest environmentally.)

Pojasek: (Group 1) Both of the indicators submitted for peer review have potential significant problems that affect their utility for the purpose of including them in the “Report on the Environment.” I have suggested that the EPA consider changing the hazardous waste indicator to a **leading** indicator – “The amount of money EPA commits to waste minimization and pollution prevention technical assistance and research as a fraction of the total EPA operating budget.” This indicator is measurable and can be back calculated. EPA stated, “The RCRA program continues to pursue the goal of reducing or eliminating the generation of hazardous waste.” However, their funding (e.g., PPIS Grants) of pollution prevention and waste minimization has been on the decline. They do not even have a budget to reprint their publication, *An Organizational Guide to Pollution Prevention* (EPA/625/R-01/003, August 2001). There is a clear link between waste minimization and pollution prevention and reductions of the effects of hazardous wastes on human health and the environment. On the municipal solid waste side, the EPA supports a program that promotes recycling (“Pay as You Throw”). It has been suggested that they might be more effective to start a “Zero Waste” program (this has already been formally started in California and other cities and counties in the United States as well as in a number of other countries). EPA could then create a similar **leading** indicator to the one proposed for hazardous waste minimization and pollution prevention. The EPA needs to demonstrate its commitment to prevention and “walk the talk” in its own programs to conform with the federal facility requirements under Presidential Executive Order 13148. I believe others will follow their example.

Pojasek: (Group 2) Both of the indicators submitted for peer review have potential significant problems that affect their utility for the purpose of including them in the “Report on the Environment.” EPA needs to determine if the RCRA Corrective Action sites not included, the All Appropriate Inquiry Rule sites and the “Reportable Quantity” sites together constitute a significant groundwater contamination threat or threat to human health in addition to the smaller universe of sites currently included in the indicator.

Reinhart: (Group 1) Because of the delegation of MSW regulation to the states, there seem to be fewer national databases regarding land-based MSW disposal. The Franklin Studies provide the best approach available for determining MSW quantity, but because of their nature, they

cannot be verified locally. Hazardous Waste Reports provide a stronger basis for identifying the national quantity of waste and management strategies, although the significant decline in waste production reported during the past two years may suggest otherwise. Furthermore, I believe that hazardous waste more closely tracks other land disposed wastes. However, the Hazardous Waste Report does lead to some double counting of waste quantities and is biased by large volumes of deep well-injected waste that are labeled hazardous due to pH conditions that are easily neutralized.

- 2) Are there any additional *national-level* indicators that make an important contribution to answering one of the ROE contaminated wastes or contaminated lands questions, but were not proposed for ROE06, that you would recommend? (Proposed indicators should meet the ROE indicator definition and criteria, be national in scale, be of a quality that likely would pass this type of peer review, and have data that are readily available. For any new indicators proposed, provide justification for their inclusion and list references or citations for the associated underlying data sources.)

As you consider this question, *please read Attachment 5*, which provides the list of land and other indicators presented in ROE03 that EPA does not intend to carry forward to ROE06, along with EPA's rationale for withdrawing them. If you disagree with EPA's rationale and feel any of these indicators should be included in ROE06, please so indicate in your response to this question, along with your rationale for why they should be included. Note: The full text and graphics for the ROE03 indicators can be viewed on-line at: <http://www.epa.gov/indicators/roe/html/tsd/tsdLand.htm>

Pojasek: (Group 1) I have proposed a new indicator that might not meet the criteria for "administrative level 2" considerations. However, I believe that it is a worthy exception to this policy. The suggested indicator would meet the AA&U test and has a definite link to human health and the environment that the present hazardous waste indicator does not have.

Pojasek: (Group 2) I have no suggestions for additional national indicators that would meet the "Description of Indicator Levels" presented with the peer review instructions.

Reinhart: (Group 1) Construction and Demolition waste can be projected using economic trends, building permits, etc. Several studies have been conducted that also project MSW quantities using economic factors. Perhaps consumer indices can be used to predict waste quantities. However determination of the amount placed in landfill will still rely on state reports.